

IMMA

**International Motorcycle
Manufacturers Association**



HHRT

**Motorcycle Safety: IMMA's contribution to the
Decade of Action for Road Safety 2011-20**

by

The International Motorcycle Manufacturers Association (IMMA)

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Executive Summary

IMMA: The organisation

IMMA is a non-governmental organisation which represents the powered two-wheeler vehicle (PTW) industry at the global level while providing a forum where members of the industry can develop common policies.

IMMA membership covers Asia, India, Europe, North America and Australia.

IMMA's International Activities

IMMA's long-term contribution to safer vehicles is demonstrated by more than 50 years of participation in the work of the World Forum for the Harmonization of Vehicle Regulations (WP.29), updating the regulations with new technologies.

IMMA has also been a participant in the UN Road Safety Committee (WP.1) since its inception. With the passing of the United Nations General Assembly resolutions on road safety since 2003, IMMA has participated in the international discussions on improving road safety.

This document is IMMA's contribution to those discussions and the Decade of Action for Road Safety 2011-20; it contains IMMA's recommendations for short and medium term road safety improvements in rider safety.

PTW contributions

Motorcycles and mopeds provide a low cost and efficient means of mobility for millions of people around the world. In developed markets, PTWs are also the basis for extensive leisure activities. Worldwide, the industry employs 3.5 - 4.0 million people, both directly and indirectly. PTWs are also widely used for commercial and public service activities, particularly in developing countries.

The market trends

From 2000 to 2008, the number of PTWs in regular use rose from 152 to 301 million worldwide, with over 90% of the vehicles being found in Asia. Similarly, sales grew from 20 to 38 million PTWs per year worldwide, with 85% being sold in Asia.

Accident trends

IMMA fully supports the World Health Organization (WHO) the conclusions of the First Global Ministerial Conference on Road Safety: Time for Action, Moscow, November 2009, in particular the call for better accident statistics and studies. These are the essential basis for any kind of effective policy development and assessment of policy success.

The harmonization of accident statistics has many advantages but essentially it allows for greater ease in comparisons between different regions and develops the use of specific approaches or reference best practice. Key variables to include are:

- the number of fatalities, serious injuries and circulating parcs by each category of road user, with an additional dedicated PTW database;
- the number of kilometres travelled as exposure risk data; but if this is not available the ratio of the number of riders killed per 10,000 circulating PTWs;
- quick indicators for monthly PTW reports and monitoring;
- time series analysis, for enhanced prediction for certain groups and subgroups.



The country comparisons should be made by using a far wider set of variables, and in particular there should be a correlation between the trends in PTW accidents and the safety measures undertaken.

In addition, in-depth investigations based on the OECD methodology¹ are necessary to obtain further insights into the nature and causation of PTW accidents and to identify suitable countermeasures to avoid and mitigate accidents.



IMMA and the new developments in the global road safety arena

IMMA and its members fully support the need for a worldwide effort to reduce road deaths and injuries. To this end, IMMA endorses the UN General Assembly Resolutions on Road Safety and the work of the UN Road Safety Collaboration, even if it has not always been a direct participant.

IMMA believes that the Safe System approach to road safety will really make a difference. The objectives of the “Safe System” for the riders of PTWs are:

- **to use detailed accident studies to assist developed and developing countries to identify the key problems;**
- **to identify social and economic priorities;**
- **to prepare matrices of safety measures aimed specifically towards PTW riders that will fit within a more general Safe Systems approach for both developed and developing countries; and**
- **to publish these proposals in cooperation with existing bodies.**

Current and projected road safety related activities of the global PTW industry

The behaviour of PTW vehicle riders and that of the other vehicle drivers with whom they share the road remains the key to enhancing PTW road safety. As many as 95% of PTW accidents have a non-technical origin; most are related to human factors. Much of industry's efforts, in addition to developing technical safety components for its vehicles and producing technically reliable and compliant vehicles, have therefore revolved around its contributions to rider education, training and promotions. The success of road safety initiatives depends on a variety of factors, such as political will, institutional policies, quality of the road system, the vehicles, the road users and the general road safety culture. These factors vary from country to country and so policies and activities should be tailored in accordance with the specific country needs and context.

IMMA members are actively involved at national level and, where regional bodies exist e.g. the European Union, they take part in the policy making discussions and launch industry-led programmes.

For example, in the European Union, the industry initiated, in partnership with the European Commission, perhaps the most important in-depth PTW accident study in several decades (MAIDS²). Over 900 accident cases and a corresponding control group have given an unprecedented understanding of the causes of accidents. The study, like the Hurt study in the USA, has become the foundation of many industry and government policies since. IMMA believes such a data-driven approach to be essential for sound action plans.

¹ OECD: RTR 2001-2003 Projects - Motorcycle Accident Investigation : Development of a Common Methodology

² The Motorcycle Accident In-Depth Study (MAIDS), 2004, ACEM



Individual campaigns in the different regions illustrate the breadth of the industry's activities and the similarity of some of the needs. In all countries, IMMA members have been involved in helmet wearing campaigns. In Asia, the IMMA members have created a multi-country poster campaign and organised road safety seminars. There are training programmes where the governments and the industry have joined forces to set up initial rider training, as well as company-led efforts. Riders and industry have been at the forefront of developing motorcycle-friendly roadside environments, for example PTW crash barrier shields for motorcyclists. The industry also supports the more general campaigns such as those against drink-driving within their own activities.

Proposals for the international Decade of Action for Road Safety

Countermeasures need to be based on scientific research into driver and rider behaviour and before-and-after evaluations should be conducted as well.

For this, accident statistics which cover a minimum list of parameters and also reflect the specific needs of individual countries are essential. Where possible governments should also engage in in-depth studies of accidents to analyse their causes, for which an international methodology already exists.

Riders should be involved in the development and passing of safety messages e.g. on enforcement and safety-related subjects that include mutual respect, protective equipment, speed, alcohol and drug issues.

PTW riders deserve particular attention when it comes to road safety. Travelling at similar speeds to cars in traffic, they do not however have passive safety features to absorb crash energy and to reduce the consequences of an accident, like cars. This implies that whenever a PTW and another vehicle collide, the physical damage is often much greater for the PTW rider.

IMMA's immediate recommendation for the Decade of Road Safety Action is Headlight, Helmet, Road surface and Training, or HHRT. These are the key first elements for a PTW safety policy.

The **Headlight** helps to make the rider visible to other road users. The lack of such conspicuity is major cause of accidents. Just training on the headlight helps the rider to be seen.

The wearing of an approved and properly fitting **Helmet** is a proven aid in reducing the consequences of an accident.

The **Road surface** is critical for the grip it affords to the tyres and the stability of the PTW.

Initial rider **Training** provides skills and awareness for those very important first six months on the road. Subsequently, more advanced modules allow the rider to continue his life-long learning process or to step up to a higher licence category in order to obtain access to more powerful motorcycles. The modular concept is rider oriented, based on the rider's expertise, experience and skills, already acquired on a lower category PTW. Training should also address the rider's hazard awareness and perception.

Taken together these four elements create a solid and effective basis for reducing accidents in any road system. Until these basic components are fully installed other policy options will have little or no effect. These are the specific PTW components of a safe system.



2 Chapter

Road Safety & The International Motorcycle Manufacturers Association (IMMA)

IMMA is a non-governmental organisation (NGO) headquartered in Geneva, Switzerland. The purpose of IMMA is to represent the powered two-wheeled vehicle (PTW) industry at the global level while providing a forum where members of that industry can discuss matters of mutual interest. PTW or “powered two wheeler” is the correct term for the class of vehicles including mopeds and motorcycles. It will be used throughout this paper unless the topic requires specific clarity.

IMMA was formed in 1947 by PTW manufacturers from six Western European nations to provide coordination among national industries in the difficult reconstruction period following the Second World War³. With an increase in PTW popularity and volumes, involvement broadened in the 1960s and 1970s to include members from Eastern Europe and Japan. In the 1990s, organizations based in the United States and Australia joined. Since the turn of the century, participants from Canada, India and the Asian region have become members.

IMMA membership today

Regional association members:

Association des Constructeurs European de Motocycles (ACEM), representative of the industry in Europe with members from Germany, France, the United Kingdom, Italy, Spain, the Netherlands, Belgium, the Czech Republic, Ireland, Greece, Austria, Poland and Sweden.

The Federation of Asian Motorcycle Industries (FAMI), representative of the industry in Indonesia, Japan, Malaysia, the Philippines, Singapore, the Taiwan Economy and Thailand.

National manufacturing members:

The Society of Indian Automobile Manufacturers (SIAM).

The United States Motorcycle Manufacturers Association (USMMA).

Associate members:

The Federal Chamber of the Automobile Industries (FCAI), representative of the industry in Australia.

The Motorcycle and Moped Industry Council (MMIC), representative of the industry in Canada.

The traditional IMMA contribution to safer vehicles

IMMA's role today includes attention to national and regional government regulations on how PTWs are to be built and taking part in international road safety discussions. IMMA has official NGO status with the United Nations (UN) and the International Transport Forum (ITF) and an active role with the Asia Pacific Economic Cooperation (APEC) road safety initiative. A group of 21 Pacific Rim nations whose focus is economic health, the group has expanded to also work on safety issues.

IMMA's work is directed by subject committees drawn from its members and supported by a central secretariat in Geneva, Switzerland. Policies are made through member discussions and include the needs of the entire membership. IMMA proposals and policies are presented directly to the international forums in which IMMA takes part. IMMA also provides support to its members and the activities they carry out at their own regional or national level.

³ The founding name of the organization was Bureau Permanent International des Constructeurs de Motocycles (BPICM). IMMA obtained its current name in 1987.



IMMA's long-term contribution to safer vehicles has been made by more than 50 years of participation in the work of the World Forum for the Harmonization of Vehicle Regulations (WP.29)⁴. IMMA has actively led the introduction of new technologies by the upgrading of the technical regulations for the vehicles, for example, the development of regulations for brakes and lighting technologies. Similarly, for those markets which, for administrative reasons, did not adopt the UN regulations, IMMA has been active in developing ISO standards which contain the same technical requirements, in order to help the spread of safety solutions.

IMMA has taken part in the discussions of the United Nations Economic Commission for Europe (UNECE) Working party on Road Safety (WP.1), and its predecessors, since the 1960s. This governs international legal instruments, such as the Convention on Road Traffic and Road Signs and Signals and the Consolidated Resolutions.

The IMMA focus on road safety today

While continuing to support the work of WP.29 and WP.1, in 2008, IMMA's road safety activity was redefined by its members to focus on the sustainability of the PTW from a global road safety perspective.

To this end, IMMA formed a task force with the following goals:

- identify relevant international road safety activities, starting with the UN, the ITF and the UNRS Collaboration;
- prepare an IMMA programme on road safety issues at all levels;
- analyze issues the industry considers of key importance;
- develop a plan of work to support taking part in external international discussions and for members to exchange ideas and best practices within IMMA;
- develop a network of contacts to support the work of IMMA;
- promote the positive uses of the PTW as an affordable and valued alternative to other transport modes.

IMMA also takes part in the road safety work of the major international agencies such as the UN General Assembly, UNECE, the UN Road Safety Stakeholders, the International Transport Forum (ITF) and the Asia Pacific Economic Cooperation (APEC)⁶ road safety group.

IMMA members work on safety issues within their own areas and regions. They also provide IMMA with expertise and experience.

⁴ This organization has become the UN's primary worldwide forum for developing harmonized international vehicle regulations.



3 Chapter

The Role of Motorcycling and the PTW Industry

PTW industry contributions

The PTW industry plays a dynamic part in society. From humble beginnings in the early 20th century, motorcycling has expanded the range of human activities and made more possible the efficient transport of goods and services. This in turn strengthens the economies of individual nations while enabling greater individual mobility.

An expanding PTW industry means job opportunities and economic progress. It contributes to growth in a wide range of related sectors, such as parts suppliers, mould makers, machining and finishing. This in turn provides careers not only to those who build PTWs and their components, but also to a wide range of logistics, transportation, sales, maintenance, PTW equipment businesses and service support businesses and industries. Although figures are not easily obtained, especially for the retail sector, it is estimated that worldwide 3.5 - 4.0 million people are employed by the PTW industry as a whole.

PTW characteristics

PTWs excel in providing convenient mobility, energy savings and economy of use. This supports the lifestyles and livelihoods of growing numbers of people.

Convenient mobility

PTWs enable greater freedom of movement in crowded urban environments and their relatively small size offers advantages for reducing congestion and decreasing the need for parking infrastructure. Where other means of public transportation do not exist, or are inadequate or inconvenient, PTWs can provide an important source of personal mobility.

Energy savings

PTWs are engineered for excellent fuel economy and to help conserve energy. PTWs, being of lower mass than automobiles, require less energy to manufacture and recycle.

Economy of use

PTWs deliver efficient transport for individuals over time, especially in an urban environment. PTWs often offer low purchase cost. That, combined with a low appetite for fuel and low maintenance costs, brings an economical means for providing greater mobility.

Unique personal experience

PTW use has attracted many around the world for the benefits it can bring to one's own life. Personal stress reduction, social activities with others, the special perspective of PTW tourism and the pleasure of riding itself as an end, are all cited as the sorts of benefits PTW recreation can provide.

Wide variety of use

PTWs are used for a wide variety of purposes around the world:

- personal mobility;
- business, courier, delivery services, sales calls, vehicle hire and even taxi services;
- public service urban emergency response for police, EMT/Medical first responders, including fire fighters in some areas, rural access for medical services and suppliers (motorcycling doctors in some regions), access to sites unavailable to larger vehicles after natural disasters;
- recreational travel and tourism, while most popularly associated with Europe, North America and Japan, interest is growing in such diverse regions as India, Asia and South America;



- PTWs are used in diverse types of motor sport activity around the globe, ranging from professional superbike to motocross to amateur rally-style events;
- social activities are increasingly popular with gatherings of like minded enthusiasts of the vehicles, and benefit rides (much like walks for various charities);
- art has also discovered PTWs as there are a growing number of collectors of classic vehicles as well as exhibits in galleries (e.g. an exhibit on “The Art of the Motorcycle” at the famous Guggenheim museum in New York broke records for visitors). Many manufacturers also find they have customers who appreciate their brand’s own special design and artistic qualities.



4 Chapter

Trends in the PTW market

In use vehicles

The total number of registered PTWs in use (often spoken of as the “vehicle parc” or “parc”) increased from 152.84 million in 2000 to 301.68 million in 2008 (97% growth). The major contributors were India and the Peoples Republic of China (hereinafter referred to as “China”) with a combined PTW parc of 71.8 million in 2000, rising to 169.4 million in 2008.

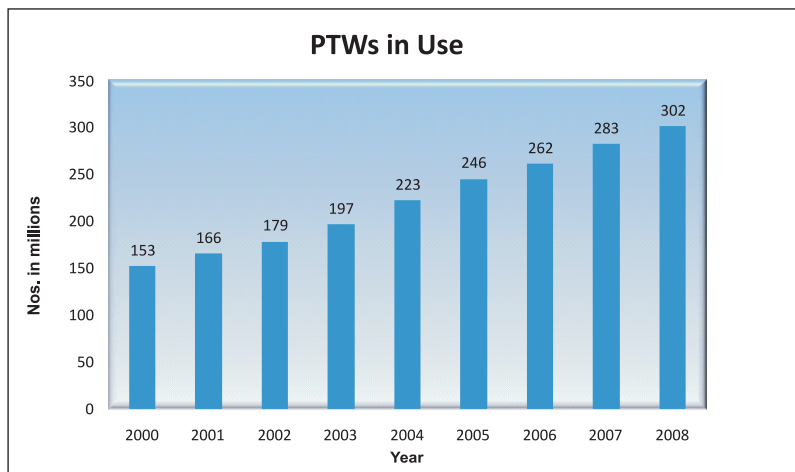


Chart I. PTWs in use Trends, 2000 to 2008. (Annex 1)

Sales trends

PTW sales from 2000 through 2008 show an increasing trend. Total sales were 20.16 million in 2000, growing to 38.5 million in 2008 (91% growth). Again China and India lead the expansion.



Chart II. Sales Trends, 2000 to 2008. (Annex 1)



Regional scenarios

The above data trends reflect different regional scenarios. IMMA member associations report some of these as follows.

Europe

After China and India, the European Union (EU) has the world's third largest population. There are 490 million residents in an increasingly urban environment. By 2020, 80% of the population will live in urban areas. The available public transport does not have the flexibility required for all individual mobility needs.

Pushed by these urban mobility needs, the region has seen six years of continuous increases in PTW sales, culminating with 2.7 million units in 2007. This represents a 22% increase since 2002. However, the economic and financial crisis initiated a first decline to sales of 2.5 million units in 2008; and had its full impact in 2009, when market figures recorded an exceptional drop to 2.1 million units. The smallest displacements (between 50cc and 125cc) are the most common, making up more than 60% of the European market.

In spite of the crisis, the PTW fleet outlook for the region through to 2017 remains positive with a 12% increase vs. 2006, bringing the total PTW fleet up to 37 million units.

United States of America

The PTW market in the USA experienced growth from the 1990s through the middle 2000s. Growth has flattened in 2008-2009 along with the rest of the economy. The reasons for the growth revolve around PTW use as a recreational or leisure activity and the relative strength of the USA's economy during the same period.

PTW use does appear to have become more socially accepted in the USA. This is reflected in an increase in the percentage of female riders in the PTW rider population (2% in 1990 to 10% in 2005).

Off-road PTW use has declined in the past decade, but some of the difference may have been taken up in an increased availability of alternative recreational vehicles⁵.

Canada

PTW sales remained strong through to the end of 2008. However, sales of PTWs have declined close to 25 percent during the first three-quarters of 2009. The drop in sales is mainly attributable to non-domestic economic factors such as the turmoil in the global financial system, related consumer credit tightness in the market and uncertainty in the North American automotive industry. Rebounding economic conditions in Canada point to an improvement in PTW sales in Canada in 2010.

Australia

In Australia off-road motorcycles constitute 40% of the market. Some issues related to the PTW are access to "bush land (lightly populated back country)" and vehicle noise in these bush areas. Such access is critical as this is likely to boost off road PTW sales. However noise is a key issue for bush residents and must be addressed, even for off-road use. While Australia has no emissions regulations for PTWs, much of the Industry is promoting vehicles that are emission compliant in other regions. Due to the economic downturn, sales are forecast to drop 25% in 2009. The 2010 forecast is for a 3-5% increase to 55,000 units.

Japan

2008 domestic sales of 522,315 PTWs indicated a drop of 23.7% from 2007. Sales of vehicles of 50cc and under have been steadily declining over recent years. However, the 51-to-125cc and over 250cc categories had positive growth in 2008. Expanding consumer use of 51-to-125cc PTWs for commuting and business is one factor behind this growth. A 2005 introduction for a new automatic transmission PTW driver's licence category and the lifting of the ban on tandem riding on expressways contributed

⁵ This includes all terrain vehicles (ATVs) and the more recently popular side-by-side utility vehicles.



to the growth in the 250cc-and-over category. In March 2008, the number of in-use PTWs dipped to 12.79 million, down 1.1% from the previous year. PTW use peaked at 18.67 million in 1986, and has steadily declined to the current par. The trend has been attributed to Japan's shrinking youth population and changes in how people use their free time.

Indonesia

The PTW market grew significantly in 2008. Total sales were 6.2 million, an increase of around 32,6% compared to the previous year. The growth of the Indonesian PTW market is mostly related to stable political, social and economic conditions, the economies of PTW use as compared to public transportation, ability to obtain financing, aggressive marketing and sales promotions as well as a growing number of motorcycling activities. The trend since November 2008 finds the market is decreasing due to the global financial crisis.

India

PTW sales have shown 2.6% growth during 2008-09 over 2007-08. Sales were 7.43 million as compared with 7.25 million during the period. Mopeds and Scooters grew by 4.22% and 9.11% respectively, while other PTW segments grew slightly. However, the new electric two wheeler segment grew by 49.48%, maybe because of rising fuel prices.



Accident Trends

General

Accident statistics are an indispensable part of the efforts by all interested parties to grasp the true picture surrounding traffic accidents as well as to adopt and advance concerted approaches to solutions rooted in a foundation of shared scientific knowledge. Unfortunately there are countries where accident statistics are not collected or maintained to an adequate level for policy purposes. Where statistics are collected, countries often fail to base such statistical information on unified international formats. In a report by the World Health Organization⁶, the following comments were made with regard to traffic accident statistics:

- major differences exist in the methods used to collect and report country statistics;
- reliable data is necessary to assess the scope of the traffic injury problem, to target responses to it and to monitor the effectiveness of intervention measures.

Traffic Accident Statistics in Selected Countries

The following is a summary of traffic accident statistics compiled in various countries based upon the WHO report. An examination of this information reveals that neither the years nor the categories in the data match fully. In many countries the data itself has not been compiled in a sufficiently detailed fashion to be adequate for the purpose of improving PTW safety.

United States of America

The total number of road accident fatalities in the United States in 2006 was 42,642 persons, with accidents involving PTW and three-wheeled vehicles accounting for some 11% (4,690 persons) of those fatalities. The total number of vehicles registered in the USA that year was 251.4 million units, including 7.5 million (3%) PTW and three-wheeled vehicles. For each 10,000 registered vehicle units, the number of PTW fatalities occurring in 2006 was 6.22 persons.

Europe

In 2006, the total number of road accident fatalities in the EU nations was 37,872 persons, with 18% (6,812) of those fatalities occurring in PTW and three-wheeled vehicle accidents. Vehicle registration was 281.7 million units, with 31.9 million (11.3%) of those vehicles being powered two and three-wheeled varieties. The number of PTW accident related fatalities in 2006 per 10,000 units was 2.14 persons, (computed from the latest data available from each country, although the data years are not uniform.)

Compared to other modes of transport, PTWs have shown a slower progress with a 10% reduction in fatalities for all PTWs in the period 2001–2008, in a context of a 17 % fleet increase. Further improvements will need a detailed analysis of the PTW results.

Moped safety has improved. Between 2001 and 2008, a reduction of 39% in moped fatalities has been recorded, an important reduction in a stable circulating parc. Motorcycle rider fatalities have experienced a 2% increase, however it must be highlighted that the motorcycle fleet increased by 34% for the period 2001-2008. The ratio death/10,000 motorcycles improved by 24% for the period 2001-2008.

Canada

The total number of road accident fatalities in Canada in 2006 was 2,889 persons, with PTW and three-wheeled vehicles accounting for 7% (202) of those fatalities. Aggregate vehicle registration was 20 million units, 3% (601,950 units) of which were PTWs and three-wheeled vehicles. The number of PTW accident related fatalities in 2006 per 10,000 units was 3.34 persons.

⁶ Global Status Report On Road Safety (2009)



Although the number of PTW accidents has been increasing, the accident rate is very stable due to the large increase in the number of PTWs in circulation over the past 10 years.

Australia

The total number of road accident fatalities in Australia in 2007 was 1,616 persons, with PTWs and three-wheeled vehicles accounting for 242 fatalities (or 15% of the total). Overall vehicle registration for the year came to 14.8 million units, 4% (590,997 units) of which were PTWs and three-wheeled vehicles. The number of PTW accident related fatalities in 2007 per 10,000 units was 4.1 persons.

The latest Federal government figures show that the rolling annual rider road toll at the end of each month has continued to fall and dropped by 12% from March 2009 to February 2010. All other road user groups continued to experience increased fatalities for the same period with car drivers rising 4.9 percent with passengers (+7.9%), pedestrians (+2.6%) and cyclists (+6.5%) also up.

India

The total number of road accident fatalities in India in 2006 was 105,725 persons, with PTW and three-wheeled vehicle accidents accounting for 27% (28,545) of those fatalities. Total vehicle registration for 2004 was 72.7 million units, with 51.6 million (a 71% share) of those vehicles recorded as PTWs and three-wheeled models. The number of accident-related fatalities in 2006 per 10,000 registered units during that year in India was 5.53 persons.

FAMI member countries (excluding Taiwan)

The total number of road accident fatalities in FAMI member countries was tracked at 43,360 persons, with 23,779 (55%) of those fatalities involving PTW and three-wheeled vehicles. Aggregate vehicle registration in these nations was found to be 203.5 million units; 85.8 million units (42%) of which were comprised of PTW and three-wheeled vehicles. The number of accident fatalities per each 10,000 registered units was 2.77 persons (computed from the latest data available from each country, although the data years are not uniform).

Figures for Japan show that by comparing the 2008 data to the 2001 data, we can see major declines in fatalities for all types of road users. For motorcycles, fatalities declined by 30%. For the under 50cc class, the rate of decrease was 44%. The ratio death/10,000 for PTWs improved by 32% in the same period.

Need to Harmonize Accident Statistics

Problems exist especially when it comes to the harmonization of accident statistics definitions. There is a need to harmonize definitions such as fatality, serious injury, crash injury classification (serious, light injuries) to improve the statistics due to the lack of health sector monitoring and under-reporting of injuries, not only for PTW but for all road users.

The harmonization of accident statistics has many advantages but essentially it allows for greater ease in comparisons between different regions and develops the use of specific approaches or reference best practice. For example, the definition of the number of fatalities differs from country to country and makes reliable comparison of data very difficult. In order to harmonize the international specifications for accident statistics, it is important to gain the understanding of the agencies and organisations that oversee this accident statistics work in each country



Better and improved knowledge on road safety and PTW

There is a strong need to deliver reviews of the PTW road safety performance periodically. This will provide policymakers, safety practitioners, and researchers with easily accessible research facts and data, to allow them to give an impartial, evidence-based view on PTW safety topics and to inform about remedial policies.

Such analysis should be made on the basis of accurate and harmonized data for:

- the number of fatalities, serious injuries and circulating parcs by category of road users (all road users, moped, motorcycle and all PTWs) recorded in a dedicated PTW database;
- the number of kilometres travelled as exposure risk data; but if this is not available then the ratio of the number of riders killed per 10,000 circulating PTWs is an interesting indicator to compare the PTW road safety situation among regions and countries;
- quick indicators for monthly PTW reports and monitoring;
- time series analysis – enhanced prediction for certain groups and subgroups.



The country comparison should be made by using a great number of different indicators (including economics, demographics, etc) for the final settings of goals and targets at regional level.

Specific important indicators that should be used are:

- the correlation between the trends of PTW accidents and the safety measures undertaken during a definite period;
- personal safety and traffic safety rate.

In addition, in-depth investigations based on the OECD methodology are necessary to obtain further insights into the nature and causation of PTW accidents and to identify suitable countermeasures to avoid and mitigate accidents. Such studies have been carried out in Europe and Thailand. Insofar as the studies adhere closely to the OECD methodology their results will be internationally comparable, which is the desired goal for the current study being undertaken in the USA.

Quantitative Statistical Analysis

Although it is possible to gather data from various different perspectives, IMMA attaches importance not only to the number of PTW fatalities, but also to probing the number of fatalities per unit owned by carrying out comparisons with exposure data⁷. This data allows for analysis of the reasons and the realities behind fluctuations in accidents, and enables the drafting of strong response guidelines. Examples of this type of analysis in several different countries are outlined below for a few markets in which the data exists. Unfortunately these markets represent a small proportion of fatalities, so more analytical work will be necessary to assist policy making, which will require better data in more countries. The extent of the existing statistical coverage is given in Annex 2.

	Number of fatalities from passenger car accidents			Number of fatalities from PTW accidents			% share of PTW accident fatalities in overall road fatalities		Number of accident fatalities per each 10,000 PTW in use	
United States ⁸	31,899 (1998)	25,351 (2008)	-21%	2,294 (1998)	5,290 (2008)	+131%	6% (1998)	14% (2008)	6.67 (2000)	8.49 (2008)
Europe ⁹	29,372 (1996)	16,428 (2006)	-44%	7,363 (1996)	6,812 (2006)	-7%	14% (1996)	18% (2006)	3.10 (1996)	2.14 (2006)
Japan ¹⁰	2,983 (1998)	1,269 (2008)	-57%	1,982 (1998)	1,163 (2008)	-41%	18% (1998)	19% (2008)	1.12 (1998)	0.77 (2008)

⁷ Exposure data refers to a database concerning traffic vehicles that are not involved in accidents. Comparing these vehicles with vehicles that are in accidents facilitates analysis of accident vehicle factors (distinguishing features, etc.).

⁸ For the United States the source is the National Highway Traffic Safety Administration (NHTSA): Fatalities are defined by death within 30 days of the accident.

⁹ For Europe the source is IRTAD: Fatalities are defined by death within 30 days of the accident, CARE database (EC/DG-TREN) and ACEM.

¹⁰ For Japan the source is National Police Agency: Fatalities are defined by death within 30 days of the accident.



6 Chapter

IMMA and the Recent World Trends in Road Safety

IMMA and its members fully support the need for a worldwide effort to reduce road deaths and injuries. To this end, it supports the aims of the UN General Assembly Resolutions on Road Safety and the work of the UN Road Safety Collaboration, even if it has not always been a direct participant. Similarly, IMMA has been fully involved in the road safety activities of the International Transport Forum (ITF), most notably the successful Lillehammer Motorcycle Workshop in June 2008.

IMMA believes that the Safe System approach to road safety, as set out in the ITF publication, **Towards Zero: Ambitious safety targets and the safe system approach**¹¹, is the best way of achieving real long term reductions in road traffic deaths and injuries.

For the longer term, and in alignment with the call for a **“Decade of Action for Road Safety: 2011-2020,”**¹² IMMA is committed to collaborate with relevant international parties and in particular:

- to work with all the lead agencies in countries where there are IMMA members;
- to support the transfer of knowledge, for example as set out in this position paper;
- to support the general safety policies proposed for the Decade of Action, e.g. anti drink-drive, anti speeding, enforcement of existing legislation, introduction of road rating systems.

¹¹ ITF (2008).

¹² The Decade of Action for Road Safety was announced in the Moscow Declaration on 20th November 2009, at the end of the First Global Ministerial Conference on Road Safety: Time for Action Moscow, 19-20 November 2009



Current & Projected Road Safety Related Activities of the Global PTW Industry

Education and Action

General

The behaviour of PTW vehicle riders and those of the other vehicle drivers with whom they share the road remains the key to enhancing road safety. As many as 95% of PTW accidents have a non-technical origin; most are related to human factors¹³. Much of industry's efforts, in addition to developing technical safety components and producing technically reliable and compliant vehicles, have therefore revolved around its contributions to rider education, training and promotions.

IMMA members are involved in many actions at national level; Annex 3 contains a non-exhaustive list of the bodies with which the industry works.

European Union: Activities to improve knowledge and take action

ACEM

The public face of the PTW industry for road safety is ACEM. ACEM has a tradition of taking initiatives to improve the safety of its members' customers. The following are a sampling of its activities¹⁴.

MAIDS



In 2004 ACEM, in partnership with the European Commission, produced perhaps the most important PTW accident study in several decades. The Motorcycle Accident In-Depth Study (MAIDS) presented a comprehensive review of 921 PTW accidents and their causes. Over 2000 variables were reviewed for each occurrence, by trained accident investigators. Another 923 riders from the same areas who did not have accidents were also researched. The results are insightful and will have a long-lasting impact on how the safety community views PTW riders for years to come. (<http://www.maids-study.eu/>)

European Safer Urban Motorcycling (eSUM)



This project, co-financed by the European Commission, is a collaborative initiative between the motorcycle industry, local authorities of the principal European motorcycle cities and universities to identify, develop and demonstrate measures designed to deliver safer urban motorcycling.

¹³ <http://www.maids-study.eu/>

¹⁴ For a full understanding of the work of ACEM, please view their web site at <http://www.acem.eu/cms/index.php>



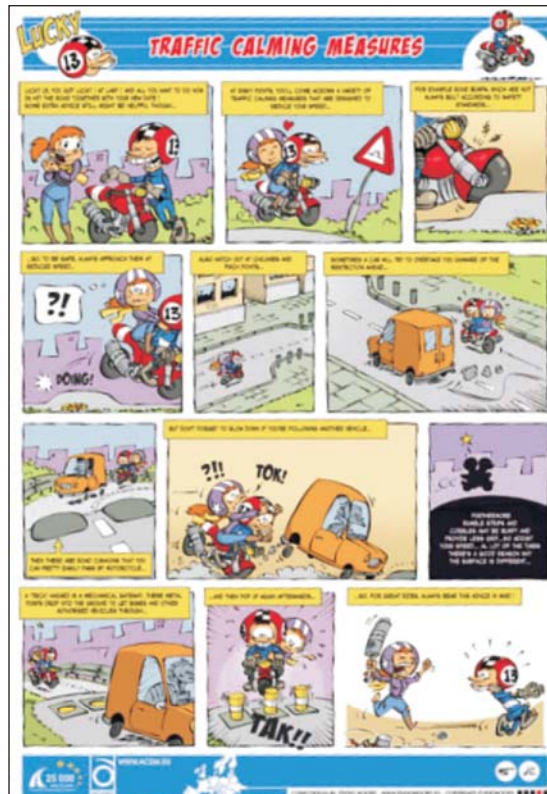
The Initial Rider Training Project (IRT)



Led by FEMA (Federation of European Motorcyclists' Associations), with ACEM as a partner, this project was co-funded by the European Commission and created a modular European initial rider training programme¹⁵.

Lucky 13

Lucky 13¹⁶ is a series of cartoons (comic strips) presenting safety issues to riders. Drawn by an artist familiar to PTW riders, the series takes a different and delightful approach to bringing safety tips to the public.



The Integrated Helmet Campaign “Wear & Lock”

This ACEM initiative targets young riders and conveys messages on the proper wearing of helmets, through television broadcasts, information leaflets and billboards.

Canada

PTW safety initiatives in Canada have focused on three main areas – research on licensing, rider training and education, and safety awareness programs. MMIC commissioned the Traffic Injury Research Foundation (TIRF) to undertake studies on PTW licensing systems in the 1980's and early 1990's. Out of this research, the industry adopted a policy position supporting graduated licences for PTW riders in Canada. We are pleased to say that most provincial jurisdictions in Canada have implemented a graduated licensing system.

¹⁵ (<http://www.initialridertaining.eu/>)

¹⁶ <http://www.acem.eu/cms/overview.php>





The MMIC has funded and supported PTW rider training since the 1970's. Hundreds of thousands of new riders have obtained their PTW licence through the rider training program.

Since its formation in the early 1970's the MMIC has prepared and produced rider safety awareness programs. The current program 'Ride like a PRO' includes a poster, pamphlet and CD promoting rider safety.

The USA: Active coalitions, participant forums and government transparency

The United States Motorcycle Manufacturers Association (USMMA)

USMMA is the IMMA representative organisation for the USA. The PTW market is smaller than that in the EU. Activities tend to be in support of established institutions and organisations as the following examples and the institutions listed in Annex 3 show¹⁷.

Rider education

Rider education is required for licensure in many US jurisdictions. The Motorcycle Safety Foundation (MSF)¹⁸ is the nation's leading provider of PTW licence training and has representatives from USMMA and other PTW companies on their board of directors. Training course templates are made available to programmes in the states and have proven quite popular. Recently, in recognition of the growing popularity of scooters in the country, MSF began offering "Scooter School," meant specifically for the riders of these vehicles.

Rider's edge

In 2000, one USMMA member began offering a proprietary version of the MSF programme. Rider's Edge has proved very popular, with courses offered in most states. From its beginnings in 2000, Rider's Edge has provided training to over 190,000 students¹⁹. The programme has since been extended to the European dealer organization of the company and further extension to Asia is being studied.



Scooter School



Rider's edge instruction

¹⁷ The ensuing list is intended to be representative and is by no means exhaustive.

¹⁸ For an overview of all the MSF tools, view the website at <http://msf-usa.org/>.

¹⁹ The Rider's Edge web site is at <http://www.ridersedge.com/>.

India: Millions of vehicles in use, the region includes rapidly emerging as well as mature markets.

The India subcontinent: Increasing mobility and growing PTW use

The India subcontinent is also a base for PTW safety activities. SIAM is an IMMA member and performs a growing number of activities under the auspices of its programme "SAFE (Society for Automotive Fitness & Environment)." SAFE is a SIAM initiative in cooperation with industry, government and testing agencies. SAFE focuses on creating PTW rider awareness for enhanced responsibility on road safety.



Proper use of Helmets

Public awareness activities for school students including distribution of road safety training materials, workshops, safe rider exhibitions and contests are organised.

Activities for the general public including workshops for corporate employees, training on vehicle simulators and display of road safety banners for wider awareness are some of the other activities of SIAM (www.siam.in).

Asia

Reflecting the diversity of the continent, regional IMMA representation is more wide ranging. Early IMMA participation was begun by the Japan Automobile Manufacturers Association (JAMA)²⁰. In 2006 the membership was turned over to the Federation of Asian Motorcycle Industries (FAMI)²¹, a group with national PTW industry member groups in a number of Asian nations, including JAMA.

The Road Safety Task Force

FAMI established a "Road Safety Task Force" in 2003 and has implemented activities in each member economy (Indonesia, Malaysia, Philippines, Singapore, Thailand and Taiwan).



A poster campaign has been implemented in the region. While different artwork is employed in each country, the campaign is unified by the use of the slogan, "Ride Safely, Enjoy Life!" The posters have been distributed to PTW dealers, schools and government agencies throughout the region.

Since 2003, the region has also held a series of Road Safety seminars, drawing participants from government, media, NGOs, universities and FAMI members. The purpose of the seminars, often held in conjunction with annual PTW exhibitions to take advantage of the publicity generated by such popular venues, was to increase the awareness of PTW safety and strategies to advance safe riding.



²⁰ Visit the website at <http://www.jama-english.jp/>.

²¹ See the FAMI website, with links to each national organization: <http://fami-motorcycle.org/>



Participants from Government, Universities, Media, NGO and FAMI Members at a seminar.



Speakers from Government and FAMI members at a seminar in Jakarta.

Japan

FAMI members also have led initiatives in their own countries for PTW safety. Perhaps the best example of these is from the mature Japanese market.

Safe riding initiatives

Since 1989, advocating safe riding activity in Japan has become a collaborative government-industry undertaking. This has featured designating “Motorcycle Day” and “Motorcycle Months” encouraging riders to take responsibility for their own actions and educational efforts. The “Motorcycle Day (19th August)” was initiated in 1990, introducing various safety promotions, organized jointly by the Cabinet office, Nippon Motorcycle Association (NMCA) and JAMA.



The “Traffic Safety Parade” appealed for efforts to expand safe driving knowledge and experiences

During the “Motorcycle Months” of July to September, local government and industry stage motorcycling safety events. More than 300 separate events are held throughout Japan during these months. Over 40,000 citizens participated in 2005.

The Good Rider's Declaration Programme (by the Japan Motorcycle Safety Association (JMSA)) was launched in 1987, followed by the Good Rider Registration in 1996. These programmes are based on the cooperation of PTW dealers who give the riders information about safety enhancement and theft prevention methods face to face.

Safe Riding Lessons are offered by Japan Traffic Safety Association (JTSA) and JMSA. With a view to upgrading the safe riding skills and manners of riders, local and national safe riding contests have been staged annually since 1968, making 2009 the 42nd contest. Prefecture-level contests are held in April to July, with over 3,000 riders every year. The top 187 riders gather at the two-day national contest in August.



Advertisement in major Japanese newspaper appeals for the fun and utility of motorcycle and promotes wider understanding of safety riding.

Public awareness

JAMA also leads road safety public awareness activities. JAMA's own initiatives include measures aimed not only at the PTW rider, but all road users. In August, 2004, JAMA published "Safety Action 21" to bring teenage students a comprehensive road safety education covering PTW topics. These are geared to the prospective automobile user as well as PTW riders.

JAMA also holds three month Spring and Autumn Road Safety Campaigns. It partners with other organisations to provide safety awareness posters, stickers and other information tools.



Safety activities of the PTW manufacturers

Since the 1970s, the Japanese PTW manufacturers have each established a safe riding promotion section within their corporate offices to help bring about safer riding among PTW users. One important activity is to offer riding skill improvement opportunities to riders in a school or workshop setup. For additional information, visit the individual manufacturer's web site.



Riding school to learn traffic rules and safety.



Offering Riding Simulator (All over the world)



Training for users (Africa)



Offering safety school (Japan)



Industry Work to Make Road Design “Forgiving”

Infrastructure should help “forgive” the rider who makes a mistake or is put in a bad situation. It should allow for sufficient recovery time and space and eventually being able to cope with a possible accident. The environment in which the rider and the PTW manoeuvre is of critical importance to safety. Infrastructure varies widely around the world. For some countries it is a matter of paving the road surface, while for others it is the details of the type of crash barrier or the traffic calming engineering that is important. Wherever the country is on the continuum, the evolution of their infrastructure needs to take account of the needs of PTW riders. A more detailed consideration of what needs to be done is given in Annex 4. In summary, some of the key elements are:

- the roadway needs to be properly maintained to give a smooth and regular surface;
- campaigns at all levels to explain the infrastructure needs of riders and their PTWs to the relevant authorities;
- the special needs of riders, e.g. crash-barriers should be integrated into roadway design;
- national governments should promote PTW-friendly infrastructure guidelines and standards that encourage PTW-friendly design, construction and maintenance;
- standardised procedures for data collection on accidents involving the infrastructure;
- the use of road rating systems to improve the road network e.g. iRAP and the use of experience from other countries for upgrading infrastructure.



9 Chapter

Proposals for International Action

Road safety is a complex matter and improvements in this field require the integrated, safe system approach from all actors. It is a fundamental PTW safety requirement that, PTWs should automatically have a place in overall transport policy and infrastructure policy/management.

The global industry is willing to take its share of responsibility and offers its support to the international bodies engaged in the ongoing international discussions.

Accident research

Overview

Countermeasures need to be based on scientific research into driver and rider behaviour. The effect of the countermeasures should be evaluated by before-and-after studies.

Review of accident statistics

IMMA offers their support to the International Institutions in the preparation and delivery of appropriate statistical collection systems and an up-to-date and accurate picture of the safety situation of PTWs on the road.

Such systems should include a minimum list of parameters and also reflect the specific needs of individual countries e.g. the types of vehicles in use. Accident statistics should be related to measures of relative exposure e.g. the vehicles in-use figures.

In-depth PTW accidents investigations

IMMA brings expertise, experience and support to the development of further in-depth investigations based on the OECD methodology.

If some aspects of PTW use are comparable to Europe, IMMA invites external researchers to study the MAIDS-database to obtain further insights into the nature and causation of PTW accidents and to identify suitable countermeasures to avoid and mitigate accidents.

Human factors

Influencing behaviour and attitudes

Safety messages to riders should be developed in partnership with organisations that represent riders, e.g. rider groups, PTW forums, motoring organisations. Direct contact with riders gives the benefit of peer advice and enables key messages to be passed to the rider community.

Road safety campaigns

There should be regular, targeted campaigns addressing both riders and other road users, where necessary supported by other action e.g. enforcement, on safety-related subjects that include mutual respect, protective equipment, speed, alcohol and drug issues.

Codes of practice should be developed in order to promote and market motorcycling responsibly; the motorcycling press and rider organisations should also promote responsible behaviour codes.

To develop an awareness of PTWs and mutual respect between road users, education activities and campaigns should be set up from childhood, to emphasise that "road safety means road sharing".

Campaigns should stress that the rules of the road are there for everyone's safety, riders included.



Protective equipment

Where standards for protective equipment exist, they should be promoted; and where they do not, they should be developed, taking into account their safety performance, rider comfort, the ergonomics of their use, costs and the climate/regions where they will be used.

The usage rate of safety helmets should be brought to 100% with a mix of stronger enforcement and awareness raising campaigns, particularly focussing on the need to do up the helmet strap.

Apart from rules and regulations being framed to mandate the identified protective gear, fiscal and other policy relief could also be considered to make such protective items more affordable and easily accessible to promote their usage by the common man.

It is important to recognise that there are also cultural barriers to the use of protective equipment.

Safety programmes advocates must determine what cultural barriers may exist, for example:

- are there religious barriers to the use of some equipment?
- have people shown that they are willing to follow the local laws ?” It does no good to have a safety statute in place if no one is willing to follow its requirements. In some places legislative proposals are considered to have gone too far, so that the support needed to pass them does not exit.

These are factors that programme advocates must consider. They may then be better able to set their programme strategies and priorities.

Training and education – promote and deploy high quality rider training

Rider training availability and quality vary widely between countries, because these have different training needs, based on their vehicle fleet and training resources. PTW training should therefore build on existing standards, focus on risk awareness and risk avoidance, and develop an understanding of the rider or PTW’s capacities and limitations. The standards used should be appropriate for each national or regional situation.

Initial rider training provides the necessary knowledge and skills to ride a PTW safely and gain a licence.

Adequate training can also help PTW riders to improve their vehicle control skills which are particularly important to perform emergency manoeuvres.

In the light of the accident studies, a component on awareness and acceptance of all vulnerable road users, in particular riders, should be included in the general training for all drivers, with a particular emphasis on the need for appropriate traffic scanning strategies.

Driving licence

A licensing system is necessary to ensure that all road users, including PTW riders are able to control the vehicle and drive safely in traffic. A minimum standard of rider training is recommended.

Experience has shown that a licensing system that is perceived as inappropriate and not reflecting the needs of the situation, is liable to fail and to give rise to illegal riding/driving.

Vehicle factors

The minimum safety performance of PTWs should be based on ECE and Global Technical Regulations.

In-depth accident studies have shown that regular maintenance will avoid any vehicle-related contributions to accidents.

IMMA strongly supports the use of the headlight as a conspicuity aid and has implemented the worldwide use of automatic headlight-on designs in support of this policy.

Infrastructure

The need for a PTW-friendly, forgiving road

Road infrastructure improvements to enhance safety should consider the effects on all road users, so that they would not be at the cost of, or detrimental to the safety of particular groups of vulnerable road users, such as motorcyclists and moped riders.



The identification and resolution of roadway design problems (e.g. accident black spots, “corridor” analysis of a sequence in the road structure) should include input from rider representatives and relevant experts.

Safe infrastructure guidelines handbook, audit programmes and awareness

Handbooks such as “Guidelines for PTW-safer road design in Europe” and audit programmes such as iRAP should be encouraged, as they contribute to the dissemination of best practices and the development of awareness about the roles and relationships of the infrastructure, the rider and the PTW on the road.

Each level of government should include in their infrastructure guidelines, measures for accommodating PTWs, developed with input from relevant stakeholders. The guidelines should be relevant to the needs of the jurisdiction concerned and coordinated with other jurisdictions and levels of government.

Recommendations for infrastructure improvements

IMMA’s recommendations are:

- integration of the needs of PTWs in the basic training for road designers, highway and traffic engineers;
- appropriate maintenance of the road infrastructure;
- consideration of PTW safety at the road design stage;
- exploration of new legislation aimed at the protection of vulnerable road users including PTW riders;
- revision and development of standards that encourage PTW-friendly design, construction and maintenance;
- development of standardized procedures for data collection of accidents involving the infrastructure.

Conclusions – “HHRT”

IMMA’s immediate recommendation for the Decade of Road Safety Action is HHRT, ‘Headlight, Helmet, Road Surface and Training’. These are the basic element of a Powered Two-Wheeler safety policy.

Contacts for further information

For further information and to follow up these ideas in individual regions or countries, please refer to the contact list in Annex 5.



Annexes

Annex 1

Market Trends

Table I. PTWs in use (in millions)

Region	2000	2001	2002	2003	2004	2005	2006	2007	2008
Japan	13.974	13.720	13.54	13.369	13.261	13.175	13.060	12.935	12.787
India	34.118	38.556	41.581	47.519	51.922	58.799	64.743	72.615	79.864
China	37.720	43.308	51.028	59.558	67.170	75.786	81.473	87.217	89.537
Malaysia	5.686	5.921	6.143	6.464	6.862	7.284	7.733	8.217	8.487
Taiwan	11.423	11.733	11.984	12.367	12.794	13.195	13.557	13.943	14.117
Thailand	13.816	15.236	16.581	18.210	13.207	13.195	13.557	15.962	18.56
Philippines	1.236	1.338	1.470	1.552	1.846	2.157	2.409	2.639	3.192
Indonesia					17.688	22.078	25.000	28.555	34.337
USA	4.346	4.903	5.004	5.370	5.740	6.230	6.690	6.588	6.233
Canada	0.311	0.318	0.350	0.373	0.409	0.443	0.485	0.512	0.562
Europe M/c	15.170	16.640	17.412	18.041	18.788	19.812	20.348	21.700	21.700
Europe Mopeds	15.040	14.090	13.788	14.099	13.456	13.378	13.028	12.300	12.300
TOTAL	152.84	165.763	178.881	196.922	223.143	245.532	262.083	283.183	301.676

Source: National active registrations; IMMA members.

Table II. Sales by nation and region (in millions)

Region Country	2000	2001	2002	2003	2004	2005	2006	2007	2008
Japan	0.780	0.750	0.771	0.760	0.700	0.706	0.700	0.685	0.522
India	3.752	4.001	4.792	5.123	6.010	6.797	7.777	7.416	7.351
China	9.149	9.371	10.821	11.132	12.000	12.664	13.958	17.298	17.298
Malaysia	0.238	0.238	0.229	0.317	0.398	0.433	0.449	0.484	0.541
Taiwan	0.759	0.628	0.633	0.781	0.773	0.794	0.746	0.750	0.858
Thailand	0.783	0.907	1.327	1.766	2.043	2.109	2.061	1.598	1.703
Philippines	0.214	0.240	0.290	0.343	0.495	0.585	0.605	0.553	0.595
Indonesia	0.979	1.650	2.318	2.824	3.901	5.089	4.471	4.714	6.281
USA	0.710		1.636	1.001	1.063	1.149	1.190	1.124	0.623
Canada	0.052	0.061	0.066	0.072	0.080	0.080	0.082	0.083	0.089
EUROPE	2.750	2.400	2.150	2.200	2.250	2.400	2.550	2.700	2.500
Australia					0.090	0.101	0.120	0.130	0.134
TOTAL	20.166	20.246	25.033	26.319	29.803	32.907	34.709	37.535	38.495

Source: IMMA membership

USA Source: MIC 2008 Motorcycle Statistical Annual. Does include some off-road PTWs and ATVs



Annex 2

Road Safety Figures

Sources
Main Source : IRTAD database
Complementary Source: IMMA Members

Country name	Size (sq. km)	Population (2009 est.)	Year	All Road Users Killed	PTW fatality share	Motor vehicle park X 1.000	PTW riders killed	PTW parc x 1.000	Ratio Killed / 10.000 PTWs
Afghanistan	645,807	28,395,716							
Africa	30,221,532	991,002,342							
Albania	28,748	3,639,453							
American Samoa	197	65,628							
Andorra	464	83,888							
Angola	1,246,700	12,799,293							
Anguilla	96	14,436							
Antarctica	13,209,000	1,169							
Antigua & Barbuda	442	85,632							
Antilles, Netherlands	800	227,049							
Argentina	2,777,409	40,913,584							
Aruba	193	103,065							
Asia	39,365,000	3,808,070,503							
Australia	7,682,557	21,262,641	2000	1,817	11%	12,539	191	342	5.58
			2008	1,466	17%	15,292	246	512	4.80
Austria	83,858	8,210,281	2000	976	16%	5,739	156	622	2.51
			2008	679	17%	6,235	116	664	1.75
Azerbaijan	86,530	8,238,672							
Bahamas, The	13,962	307,552							
Bahrain	694	728,709							
Bangladesh	142,615	156,050,883							
Barbados	431	284,589							
Belarus	207,600	9,648,533							
Belgium	30,518	10,414,336	2000	1,470	12%	6,363	182	628	2.90
			2008	1,067	15%	7,029	162	667	2.43
Belize	22,966	307,899							
Benin	112,622	8,791,832							
Bermuda	53	67,837							
Bhutan	46,650	691,141							
Bolivia	1,098,581	9,775,246							
Bosnia and Herzegovina	51,129	4,613,414							
Botswana	581,730	1,990,876							
Bouvet Island	49	0							
Brazil	8,544,418	198,739,269							
British Indian Ocean T.	n/a	n/a							
British Virgin Islands	151	24,491							
Brunei Darussalam	5,765	388,190							
Bulgaria	110,994	7,204,687							
Burkina Faso	267,950	15,746,232							
Burundi	27,834	9,511,330							
Cambodia	181,035	14,494,293							
Cameroon	475,442	18,879,301							
Canada	9,976,137	33,487,208	2000	2,927	6%	18,193	173	311	5.56
			2007	2,769	8%	21,115	225	522	4.31
Cape Verde	4,033	429,474							
Caribbean, the	n/a	40,744,383							
Cayman Islands	259	49,035							
Central African Republic	622,436	4,511,488							
Central America	n/a	153,320,699							
Chad	1,284,000	10,329,208							
Chile	755,482	16,601,707							
China	9,806,391	1,338,612,968	2000	no data	no data	no data	no data	no data	no data
			2007	81,649	21%	-	17,412	76,000	2.29
Christmas Island	135	1,402							
Cocos (Keeling) Islands	14	596							
Colombia	1,141,748	43,677,372							
Comoros	1,862	752,438							
Congo	342,000	4,012,809							
Congo, Dem. Rep.	2,344,798	68,692,542							
Cook Islands	237	11,870							
Costa Rica	51,090	4,253,877							
Cote D'Ivoire	322,461	20,617,068							
Croatia	56,542	4,489,409							
Cuba	114,525	11,451,652							
Cyprus	9,251	1,084,748							
Czech Republic	78,866	10,211,904	2000	1,486	8%	5,115	116	800	1.45
			2008	1,076	11%	6,363	123	860	1.43
Denmark	43,093	5,500,510	2000	498	14%	2,536	71	127	5.59
			2008	406	17%	3,125	70	237	2.95
Djibouti	23,200	724,622							
Dominica	751	72,660							
Dominican Republic	48,734	9,650,054							
East Timor (Timor-Leste)	14,604	1,131,612							
Ecuador	272,046	14,573,101							
Egypt	1,001,450	78,866,635							
El Salvador	21,041	7,185,218							
Equatorial Guinea	28,051	633,441							
Eritrea	121,100	5,647,168							
Estonia	45,226	1,299,371							
Ethiopia	1,127,127	85,237,338							
Europe (23 countries)	n/a	803,850,858	2000	51,875	15%	278,670	7,562	29,264	2.58



Sources
Main Source : IRTAD database
Complementary Source: IMMA Members

Country name	Size (sq. km)	Population (2009 est.)	Year	All Road Users Killed	PTW fatality share	Motor vehicle park X 1.000	PTW riders killed	PTW parc x 1.000	Ratio Killed / 10.000 PTWs
European Union (20 Member States)	4,324,782	489,601,562	2008	35,072	19%	313,509	6,558	34,352	1.91
			2000	50,910	15%	270,317	7,404	28,328	2.61
			2008	34,448	19%	303,714	6,428	33,239	1.93
Falkland Islands (Malvinas)	16,076	2,483							
Faroe Islands	1,414	48,856							
Fiji	18,274	944,720							
Finland	338,145	5,250,275	2000	396	5%	2,666	19	183	1.04
			2008	344	13%	3,078	46	376	1.22
France	547,030	62,150,775	2000	8,079	17%	36,924	1,393	2,646	5.26
			2008	4,275	25%	39,357	1,086	2,510	4.33
French Guiana	83,534	228,604							
French Polynesia	3,894	287,032							
French Southern Terr.	7,781	120							
Gabon	267,667	1,514,993							
Gambia, the	10,689	1,778,081							
Georgia	69,700	4,615,807							
Germany	357,021	82,329,758	2000	7,503	15%	56,280	1,102	4,915	2.24
			2008	4,477	17%	55,511	766	5,496	1.39
Ghana	238,538	23,887,812							
Gibraltar	7	28,796							
Greece	131,957	10,737,428	2000	2,037	25%	7,403	502	2,342	2.14
			2008	1,612	29%	10,645	469	2,916	1.61
Greenland	2,175,600	57,600							
Grenada	345	90,739							
Guadeloupe	1,780	441,838							
Guam	545	178,430							
Guatemala	108,894	13,276,517							
Guernsey and Alderney	91	65,484							
Guiana, French	83,534	228,604							
Guinea	245,857	10,057,975							
Guinea-Bissau	36,123	1,533,964							
Guinea, Equatorial	28,051	633,441							
Guyana	215,083	752,940							
Haiti	27,748	9,035,536							
Heard & McDonald Is. (AU)	n/a	n/a							
Holy See (Vatican)	<1	545							
Honduras	112,088	7,833,696							
Hong Kong, (China)	1,085	7,055,071							
Hungary	92,966	9,905,596	2000	1,200	7%	2,970	85	264	3.22
			2008	996	12%	4,033	117	408	2.87
Iceland	102,928	306,694	2000	32	3%	175	1	2	5.00
			2008	12	8%	266	1	11	0.91
			2001	9,522	no data	no data	no data	38,556	no data
2007	16,548	no data	no data	no data	72,615	no data			
Indonesia	1,904,443	240,271,522							
Iran, Islamic Republic of	1,648,195	66,429,284							
Iraq	434,128	28,945,569							
Ireland	70,273	4,203,200	2000	415	9%	1,715	39	31	12.58
			2008	279	10%	2,535	29	37	7.84
Israel	20,991	7,233,701	2003	445	no data	1,982	40	no data	no data
			2008	412	no data	no data	46	no data	no data
			2000	6,649	19%	47,672	1,279	1,65	
2008	5,131	30%	50,831	1,540	9,290	1.66			
Ivory Coast (Cote d'Ivoire)	322,461	20,617,068							
Jamaica	10,991	2,825,928							
Japan	377,812	127,078,679	2000	10,403	18%	92,001	1,847	15,319	1.21
			2008	6,023	19%	96,151	1,163	13,120	0.89
Jersey	116	91,626							
Jordan	89,342	6,269,285							
Kazakhstan	2,715,900	15,399,437							
Kenya	581,787	39,002,772							
Kiribati	832	112,850							
Korea Dem. People's Rep.	122,762	22,665,345							
Korea, (South) Republic of	99,268	48,508,972	2000	10,236	15%	16,822	1,564	1,894	8.26
			2008	5,870	21%	21,805	1,230	1,785	6.89
Kosovo	10,908	1,804,838							
Kuwait	17,818	2,692,526							
Kyrgyzstan	199,900	5,431,747							
Lao People's Democ. Rep.	236,800	6,834,345							
Latvia	64,598	2,231,503							
Lebanon	10,201	4,017,095							
Lesotho	30,355	2,130,819							
Liberia	99,065	3,441,790							
Libyan Arab Jamahiriya	1,777,060	6,324,357							
Liechtenstein	160	34,761							
Lithuania	65,300	3,555,179							
Luxembourg	2586	491,775	2000	76	11%	330	8	10	8.00
			2008	35	23%	447	8	15	5.33
Macao, (China)	25	559,846							
Macedonia, TFYR	25,433	2,066,718							
Madagascar	587,041	20,653,556							
Malawi	118,480	15,028,757							
Malaysia	329,758	25,715,819	2005	6,188	58%	-	3,591	7,284	4.93
			2007	6,282	58%	no data	3,646	8,217	4.44



Country name	Size (sq. km)	Population (2009 est.)	Year	All Road Users Killed	PTW fatality share	Motor vehicle park X 1.000	PTW riders killed	PTW parc x 1.000	Ratio Killed / 10.000 PTWs
Maldives	298	396,334							
Mali	1240198	13,443,225							
Malta	315	405,165							
Man, Isle of	572	76,512							
Marshall Islands	181	64,522							
Martinique (FR)	1128	403,857							
Mauritania	1,035,000	3,129,486							
Mauritius	2,040	1,284,264							
Mayotte (FR)	373	223,765							
Mexico	1967138	111,211,789							
Micronesia, Fed. States of	721	107,434							
Middle East (2 countries)	5214000	202,687,005	2003	4,411	1%	7,755	40	1,073	0.37
			2005	4,962	1%	9,321	39	1,441	0.27
Moldova, Republic of	33,843	4,320,748							
Monaco	2	32,965							
Mongolia	1564160	3,041,142							
Montenegro	14,026	672,180							
Montserrat	102	5,097							
Morocco	6600000	31,285,174							
Mozambique	799,380	21,669,278							
Myanmar (ex-Burma)	676,577	48,137,741							
Namibia	825,112	2,108,665							
Nauru	21	14,019							
Nepal	147181	28,563,377							
Netherlands	41,526	16,715,999	2000	1,082	18%	8,593	196	953	2.06
			2008	677	16%	10,113	110	1,055	1.04
Netherlands Antilles	800	227,049							
New Caledonia	18736	227,436							
New Zealand	270,534	4,213,418	2000	462	7%	2,661	31	59	5.25
			2008	366	14%	3,345	50	97	5.15
Nicaragua	129,454	5,891,199							
Niger	1,186,408	15,306,252							
Nigeria	923768	149,229,090							
Niue	259	1,598							
Norfolk Island	35	2,554							
North America	24256000	340,831,831	2000	44,872	7%	239,567	3,070	4,657	6.59
			2007	44,028	12%	27,703	5,399	7,110	7.59
Northern Mariana Islands	477	51,484							
Norway	323,759	4,660,539	2000	341	13%	2,862	46	201	2.29
			2008	255	15%	3,479	37	297	1.25
Oceania (2 countries)	7,687,000	34,700,201	2000	2,279	10%	15,200	222	401	5.54
			2008	1,832	16%	18,637	296	609	4.86
Oman	309,500	3,418,085							
Pakistan	880254	174,578,558							
Palau	491	20,796							
Palestinian Territory	6,242	2,461,267							
Panama	77,082	3,360,474							
Papua New Guinea	462,840	5,940,775							
Paraguay	406,752	6,995,655							
Peru	1,285,216	29,546,963							
Philippines	300000	97976603	2004	no data	no data	no data	835	1,846	4.52
			2007	19,066	15%	no data	2,832		10.73
Pitcairn Island	n/a	48							
Poland	312,685	38,482,919	2000	6,294	4%	15,308	253	1,202	2.10
			2008	5,437	6%	19,472	318	1,350	2.36
Portugal	92,391	10,707,924	2000	1,860	23%	5,432	436	689	6.33
			2007	974	24%	6,071	234	571	4.10
Puerto Rico	9,104	3,966,213							
Qatar	11,521	833,285							
Reunion (FR)	2,547	812,813							
Romania	238,391	22,215,421							
Russia (Russian Fed.)	16,894,741	140,041,247							
Rwanda	26,338	10,746,311							
Sahara, Western	266,000	405,210							
Saint Barthelemy (FR)	21	7,448							
Saint Helena (UK)	410	7,637							
Saint Kitts and Nevis	267	40,131							
Saint Lucia	616	160,267							
Saint Martin (FR)	37	29,820							
S Pierre & Miquelon (FR)	242	7,063							
S Vincent & Grenadines	392	104,574							
Samoa	2,785	219,998							
San Marino	61	30,164							
Sao Tome and Principe	1,001	212,679							
Saudi Arabia	2,149,690	28,686,633							
Senegal	196,722	13,711,597							
Serbia	77,474	7,379,339							
Seychelles	455	87,476							
Sierra Leone	71,740	5,132,138							
Singapore	683	4,657,542	2001	no data	no data	no data	219	144	15.17
			2007	219	47%	no data	103	no data	no data
Slovakia	49,034	5,463,046	2000	628	0%	1,594	no data	46	no data
			2000	627	0%	1,834	no data	58	no data
Slovenia	20,273	2,005,692		314	13%	1,047	40	41	9.76



Country name	Size (sq. km)	Population (2009 est.)	Year	All Road Users Killed	PTW fatality share	Motor vehicle park X 1.000	PTW riders killed	PTW parc x 1.000	Ratio Killed / 10.000 PTWs
Solomon Islands	28,400	595,613	2008	214	21%	1,309	46	82	5.61
Somalia	637,657	9,832,017							
South Africa	1,219,090	49,052,489							
South America	17,819,000	392,597,416							
S. Georgia & S. Sandwich	3,903	n/a							
Spain	504,842	40,525,002	2000	5,776	15%	27,161	866	3,877	2.23
			2008	3,100	22%	35,881	678	4,912	1.38
Sri Lanka (ex-Ceilan)	65,610	21,324,791							
Sudan	2,505,810	41,087,825							
Suriname	163,820	481,261							
Svalbard & Jan Mayen Is.	61,606	2,198							
Swaziland	17,363	1,337,186							
Sweden	449,965	9,059,651	2000	591	8%	4,992	49	257	1.91
			2008	397	16%	5,888	62	502	1.24
Switzerland	41,285	7,604,467	2000	592	19%	5,316	111	733	1.51
			2008	357	26%	6,050	92	805	1.14
Syrian Arab Republic	185,180	21,762,978							
Taiwan	36,175	22,974,347	2005	2,894	43%	no data	1,244	13,195	0.94
			2007	2,573	41%	no data	1,043	13,943	0.75
Tajikistan	143,100	7,349,145							
Tanzania, United Rep. of	945,088	41,048,532							
Thailand	513,115	65,998,436	2001	11,652	0%	no data	no data	15,236	no data
			2007	12,492	0%	no data	no data	15,962	no data
Timor-Leste (East Timor)	14,604	1,131,612							
Togo	56785	6,031,808							
Tokelau	10	1,371							
Tonga	651	120,898							
Trinidad & Tobago	5,128	1,229,953							
Tunisia	163,610	10,486,339							
Turkey	773,473	76,805,524	2000	5,510	no data	5,429	no data	1,011	no data
			2005	4,525	no data	7,214	no data	1,441	no data
Turkmenistan	488100	4,884,887							
Turks and Caicos Islands	497	22,942							
Tuvalu	26	12,373							
Uganda	242,554	32,369,558							
Ukraine	603,628	45,700,395							
United Arab Emirates	77,700	4,798,491							
United Kingdom	244,140	61,113,205	2000	3,580	17%	30,477	612	954	6.42
			2008	2,645	19%	33,957	493	1,291	3.82
United States	9629047	307212123	2000	41,945	7%	221,374	2,897	4,346	6.67
			2008	37,261	14%	no data	5,380	5,200	10.35
US Minor Outlying Isl.	n/a	n/a							
Uruguay	175,016	3,494,382							
Uzbekistan	447,400	27,606,007							
Vanuatu	12190	218519							
Vatican (Holy See)	1	545							
Venezuela	916,445	26,814,843							
Viet Nam	332378	88,576,758							
Virgin Islands, British	151	24,491							
Virgin Islands, U.S.	352	109,825							
Wallis and Futuna	274	15,289							
Western Sahara	266,000	405,210							
Yemen	528,076	22,858,238							
Zambia	752,614	11,862,740							
Zimbabwe	390,784	11,392,629							
World Total (38 countries)	148,429,000	6,767,805,208	2000	125,627	12%	649,521	14,455	156,688	0.92
Note: inconsistent reference years			2007	235,974	17%	486,897	40,375	247,883	1.63



Annex 3

National and Regional Institutions with which The Industry is Developing Road Safety Initiatives

USA

1. American Motorcyclist Association

The American Motorcyclist Association (AMA)²² is the world's oldest organisation of PTW enthusiasts. Founded in 1924, and with over 250,000 members, AMA's charter is to "promote the motorcycle lifestyle and protect the future of motorcycling." A high level USMMA member employee sits on the AMA board of directors and the association does receive manufacturer support for a number of its programmes. In addition, AMA also seeks partnerships with the government agencies that regulate PTW use and safety²³ and also develops safety programmes on its own²⁴.

2. Transportation Research Board

Transportation Research Board (TRB) provides, at its annual meeting, a forum for all aspects of the transportation and safety community²⁵. Participants include representatives from all levels of government, highway construction companies, vehicle manufacturers, safety specialists, academic researchers and vehicle enthusiasts from around the world. A Motorcycle and Moped subcommittee discusses PTW issues and presents recent research²⁶. USMMA member employees are active within TRB.

3. National Highway Traffic Safety Administration

The National Highway Traffic Safety Administration²⁷ is the US government agency responsible for regulating PTW vehicle equipment as well as responsibility for road safety. As related above in the AMA section, it seeks partnerships with enthusiast organizations for safety programmes. NHTSA also participates in forums such as TRB. By law, the agency operates in a very transparent manner and actively seeks participation in its safety efforts²⁸.

4. Motorcycle Safety Foundation

The Motorcycle Safety Foundation (MSF) as previously mentioned (page 23) is the nation's primary PTW training organisation with several courses related to motorcycle, scooter, trike and off-highway motorcycle training courses. MSF uses an adult education model for its programs. A USMMA member serves on the MSF board. MSF is also a sister organisation to the Motorcycle Industry Council, an industry and related business organisation separate from USMMA as well as the Specialty Vehicle Institute of America, an all-terrain vehicle (ATV) industry group, and the All-Terrain Vehicle Safety Institute (ASI) that provides ATV safety training²⁹.

5. PTW Activist groups

Besides the AMA, there are many state and national rider membership groups with an interest in PTW safety. Their role includes active advocacy of state and national safety efforts, which often

²² Visit the web site at <http://www.amadirectlink.com/index.asp>.

²³ For example, the Ride Straight programme in cooperation with the National Highway Traffic Safety Administration, <http://www.ridestraight.org/support/psa.asp>.

²⁴ See the "Distacted Driver" video for an example of reminding other vehicle operators to be aware of PTWs, <http://www.amadirectlink.com/legisltn/resources.asp>.

²⁵ Visit the web site at <http://www.trb.org/AnnualMeeting/default.asp>

²⁶ TRB also sponsors other activities, for example a vulnerable road users conference coming up in mid-2010 in Jerusalem, http://trb.org/news/blurb_detail.asp?id=10445.

²⁷ <http://www.nhtsa.dot.gov/>

²⁸ The development of the National Agenda for Motorcycle Safety was the result of such a collaborative effort <http://www.nhtsa.dot.gov/people/injury/pedbimot/motorcycle/00-NHT-212-motorcycle/>.

²⁹ The MSF web site with links to other programs is at <http://msf-usa.org>.



also result in partnerships. The Motorcycle Riders Foundation (MRF) is perhaps the best known of these³⁰. There are state activist organisations with various names, most often using the acronym ABATE (which itself has several meanings). A simple web search for “ABATE” will bring up many of these.

6. National Association of State Motorcycle Safety Administrators

National Association of State Motorcycle Safety Administrators (SMSA). In the US, primary government responsibility for vehicle safety programs resides with the individual 50 states. This organisation represents leadership in those state programs. They can provide contacts for a wealth of safety and training related materials³¹.

Europe

ACEM is working in very close collaboration with the major players at the EU arena:

1. EU Institutions

- The European Commission:
 - DG Mobility and Transport - http://ec.europa.eu/transport/road_safety/index_en.htm
 - DG Enterprise - http://ec.europa.eu/enterprise/index_en.htm
- The European Parliament:
 - http://www.europarl.europa.eu/committees/tran_home_en.htm
- The Permanent representations:
 - The Committee of the Regions - <http://www.cor.europa.eu/>
 - The European Economic and Social Committee - <http://eesc.europa.eu/>

2. European organisations

POLIS

Network of 70 cities and regions from across Europe, which promotes, supports and advocates innovation in local transport. They strive to improve transport at local level, especially in relation to the environment & health, mobility & traffic efficiency. The economic and social aspects of transport, safety and security: <http://www.polis-online.org>.

European Transport Safety Council

ETSC is a Brussels-based independent non-profit making organisation dedicated to the reduction of the number and severity of transport crashes: <http://www.etsc.eu/home.php>.

European Road Federation

The European Union Road Federation (ERF), the Brussels Programme Centre of the International Road Federation (IRF), is a non-profit association which coordinates the views of Europe’s road sector and acts as a platform for dialogue and research on mobility issues. ERF Members represent a wide cross-section of the major stakeholders active in the construction, equipment and operation of Europe’s road network: <http://www.irfnet.eu>.

TISPOL

The TISPOL Organisation has been established by the traffic police forces of Europe in order to improve road safety and law enforcement on the roads of Europe. Their main priority is to reduce the number of people being killed and seriously injured on Europe’s roads: <https://www.tispol.org>.

FIA Brussels office

The Federation Internationale de l'Automobile (FIA) is a worldwide federation of Motoring and Touring Clubs. The FIA European Bureau of the Euro European Council provides representation to their member clubs within the European Institutions: http://www.fiabrussels.com/en/about_us/about_us_02.htm.

³⁰ <http://www.mrf.org/>

³¹ <http://www.smsa.org/>



FEMA

The Federation of European Motorcyclists' Associations (FEMA) is the representative federation of motorcycle (comprising all powered two-wheeled vehicles) users throughout Europe. FEMA represents the interests of citizens' national organisations at the European Union and agencies of the United Nations, <http://www.fema.ridersrights.org/>

UEM – the European branch of FIM

The European Motorcycle Union unifies 47 member countries and is the largest Continental Union for motorcycling in the world and the largest partner of the FIM, <http://www.uem-moto.eu/>

IRTAD

IRTAD is an international database that gathers data on traffic and road accidents from 28 out of the 30 OECD Member countries. IRTAD represents an indispensable tool for all national road administrations, road safety research institutes, car manufacturers, automobile clubs and insurers. IRTAD operates within the framework of the Joint OECD / ECMT Transport Research Centre, <http://internationaltransportforum.org/irtad/index.html>

CIECA

CIECA is the international commission for driver testing authorities, active in the fields of road safety and driver testing. CIECA members include 49 driver testing authorities and organisations from 40 countries worldwide, <http://www.cieca.be/>

3. Research institutes and universities across Europe

MAIDS: Motorcycle Accidents In Depth Study is available to external research projects. If a researcher or a road safety analyst would like to have access to the MAIDS database they could contact ACEM.

At National level

National industry and trade associations - members of ACEM are working jointly with the main stakeholders in their countries: Ministry of Transport, National Parliament, Users organisations, riding schools and many others.

Japan

IMMA's Japanese member organization The Japan Automobile Manufacturers Association (JAMA) has regular discussions with the following road safety organizations in their country.

Name of Organisation	Activity
1. Government Organisations	
National Police Agency (NPA) http://www.npa.go.jp/english/index.htm	Licence, Enforcement
Ministry of Land, Infrastructure, Transport and Tourism (MLIT) http://www.mlit.go.jp/index_e.html	Vehicle regulation
Ministry of Internal Affairs and Communication (MIC) http://www.soumu.go.jp/english/index.html	Emergency medical care
Ministry of Education, Culture, Sport, Science and Technology (MEXT) http://www.mext.go.jp/english	Road safety education
2. Related Organizations	
Nippon Motorcycle Association (NMCA)	Road safety promotion

Nippon Motorcycle Association (NMCA) was established in 1997 as corporation in the public interest. NMCA appeals to the fun, convenience, and utility of PTWs by dealing with the matter of



safety. NMCA is made up of its head office and 8 branches across the country, and is conducting activities that are both nationwide in scale and highly regional. It has 12,223 affiliated dealerships as of March, 2007. <http://www.nmca.gr.jp>

Japan Motorcycle Safety Association (JMSA)

Safety riding education

Japan Motorcycle Safety Association (JMSA) is a nationwide-scale organisation in the public interest under the jurisdiction of the National Police Agency. The organisation is active in advancing the spread of safe PTW riding to prevent traffic accidents and pleasant use of PTWs; it also has as its goal the prevention of PTW theft. JMSA has held a National Safe Motorcycle Driving Convention every year since 1968.

<http://www.nifukyo.or.jp>

Japan Safe Driving Centre

Safety riding training

Japan Safe Driving Centre was established in 1991. With the goal of studying the fundamentals and application of safe riding while experiencing the danger limits of riding in a manner that cannot be experienced on public roads, the Center has set up 13 types of cutting-edge educational facilities such as training courses and riding simulators, and conducts training that provides practical experiences backed by a staff of teachers who possess practical and highly specialized knowledge. <http://www.jsdc.or.jp/school/ken.htm>

Institute for Traffic Accident Research and Data Analysis (ITARDA)

The goal of Institute for Traffic Accident Research and Data Analysis (ITARDA) is to contribute to the realization of a safer, more smoothly-operating and orderly automobile society by preventing traffic accidents and reducing the number of injuries they cause through comprehensive investigation and analysis of traffic accidents and people, roadway traffic environments, and automobiles. The Institute was established in 1992 with the sanction of the Prime Minister and the Ministers of Transport and Construction at the time. The institute provides traffic accident analysis results reports, traffic accident statistical databases, and the like to the general public.

http://www.itarda.or.jp/english/eg_home.html

Japan Traffic Safety Association (JTSA)

Road safety promotion

Japan Traffic Safety Association (JTSA) is a private sector organisation founded in 1950 with the goal of eliminating traffic accidents. Their principal activities include edifying people about and spreading traffic safety awareness, advancing traffic safety education, holding training events for those involved in traffic safety, creating and distributing traffic safety education materials, and the like. <http://www.jtsa.or.jp>

Japan Traffic Safety Education (JATRAS)

Safety riding education

Japan Traffic Safety Association (JATRAS) conducts activities to promote and spread safety education through its various operations such as traffic safety instructor cultivation, creating and disseminating traffic safety education materials, and providing information about examples of implementation of safety education.

<http://jatras.or.jp>

International Association Traffic and Safety Science (IATSS)

Safety riding research

International Association of Traffic and Safety Science (IATSS) aims to contribute to the realization of an ideal automobile society through such things as surveys and research into traffic and safety, holding various seminars, publication and PR activities, and offering awards for research, educational and other activities.

<http://www.iatssforum.jp/english/index.html>

Japan Automobile Research Institute (JARI)

Vehicle safety research

Japan Automobile Research Institute (JARI) was launched in 1969 as a testing and general research organisation in the public interest with the goal of contributing to the sound development of the automobile society. Since its inception, JARI has conducted research in a wide range of fields pertaining to automobiles (including PTWs) such as safety, the environment, and new energy sources, and is contributing to the development of a sounder automobile society in the future.

<http://www.jari.or.jp/english>



Annex 4

Powered Two-Wheeler Safety – The Role of Road Infrastructure

Introduction

Road safety needs an integrated approach and infrastructure design and maintenance can curb the number of road accident victims. Significant numbers of accidents involving PTWs can result from infrastructure shortcomings. According to the European MAIDS study³², PTW/infrastructure collisions were present in 17% of the examined cases. Moreover, the road environment is a contributing factor in almost 15% of PTW accidents. The nature of the problems varies greatly, depending on the infrastructure already in place. For countries with a road system that may not all be paved and in which crash barriers and traffic calming measures are relatively new concepts, the emphasis is on upgrading the surfaces and introducing protective barriers and traffic management systems.

In countries with already well-advanced infrastructure, there is a need to propose innovative solutions and to implement the already existing ones so that PTWs enjoy increasing levels of safety on the infrastructure. These include predictable road geometry, good visibility, obstacle free zones and good quality road surfaces with high levels of skid resistance. While important for all road users, they become essential for PTW riders.

Basic concepts

A paved road with a good adhesion is a basic requirement. The road infrastructure does not end with the pavement, in addition there are the road signs, the safety barriers, traffic calming measures such as speed humps and everything in the vicinity of the roadway. All these elements can either affect the stability of the PTW or the safety of the rider in the event of a collision. Work in this area has been mostly carried out in countries with a developed infrastructure. The lessons learnt in these countries can be used to avoid the same problems in developing infrastructures. The key point for infrastructure safety, after the road surface, is to understand the collision dynamics in relation to the overall road infrastructure. Powered two-wheeler accidents involving infrastructure are of two distinct types, where the rider impacts the barrier or roadside object while still operating the vehicle or where rider and vehicle have become separated beforehand and are both sliding along the surface towards the obstacle. Each needs to be evaluated separately to determine possible remedial measures.

The dangers from the first type of accident are most apparent. The latter type can have particularly severe consequences when the rider, having become separated from the PTW, impacts the road restraint system. The person either slides partially under the system and impacts the supporting posts, receiving severe injuries or is stopped abruptly in the case of concrete barriers.



When paved, a road needs to be built.



When paved, a road needs to be built.



Warning sign on the outer curve may present hazard to PTW (H.Monderman, NL)



Examples of Jersey roadside barrier (ITC, Bulgaria)



Road (design) with obstacles alongside the road (DTV Consultant, NL)



Example of a cable barrier (<http://www.fema.ridersrights.org>)



³² Op cit.

Safer road engineering

Preventing loss of control of a PTW and mitigating the consequences of the possible accident are two areas where infrastructure has a key role to play. Through better roads it is possible to avoid altogether, accidents that would otherwise cause serious injuries to PTW riders.

Prevention

Losing control of a PTW can be due to a number of different causes. Manhole covers, for instance, should be designed, installed and maintained bearing in mind that, especially when wet, they will create a reduced surface grip for PTW tyres.

Speed calming measures can be an effective deterrent against excess speed, a major accident severity factor. However, careful engineering will ensure that these roadbed modifications do not themselves present a hazard to PTWs and be adequate to curb speed safely for all types of users. For this the United Nations has issued guidelines.



Drains (covers) can be a problem for PTWs, because of the loss of surface grip (source: ITC, Bulgaria)



These speed inhibitors form a potential hazard for the rider because of the loss of grip on the surface (source: DTV Consultants, NL & C. Carey-Clinch, MCI)

Visibility of obstacles, for instance a narrowing of the road, is especially important for PTWs. (source: H. Monderman, The Netherlands)

Speed inhibitors (speed bumps) form a small change in vertical alignment while maintaining surface grip, so can be safe for the PTW rider (source: DTV Consultants, the NL).

Variable message signs can also act as a speed calming measure. They can warn the PTW rider that an upcoming section of road (a curve or a series of curves) is hazardous for particular categories of users, recommending changes in speed.

Roadside clutter can prevent a clear view of PTWs by other vehicle riders. Too many signs and signals make it harder for the PTW to be seen and accidents avoided. A good balance should be sought between the need to communicate to road users and avoiding a visual "blind spot." Trees and shrubbery can also create visual obstructions.



Visibility of PTWs on intersections (source: BIVV, 2005 & ITC Bulgaria)





Unpredictable bends are a hazard to the PTW rider
(source: A.J.Sharp IHIE.)



This bend has been fitted with marked posts to make it more predictable
(source: A.J.Sharp IHIE)

Avoid the unexpected

Design infrastructure that is self-explanatory or that is seen as ordinary. Unexpected or unfamiliar road features or layouts can create an increased risk of accident.³³

Share the lanes

In busy urban areas there is a competition for road space among different groups of road users. Many traffic management measures involve giving priority to one group in particular areas or at particular times of the day. It may be good policy to allow PTWs into high occupancy vehicle (HOV) lanes, bus lanes and advanced stop lines at intersections. In the USA, for example, HOV lanes built using federal funds must allow PTW use.

Alternatively, PTWs can be separated from other vehicles when the numbers are great. Such strategies are already used in Europe and Asia.



Use of bus lane by riders
(source: Craig Carey-Clinch, MCI, UK)



Advanced stop lines for PTW
(source: Ian Mutch, UK)

Mitigation

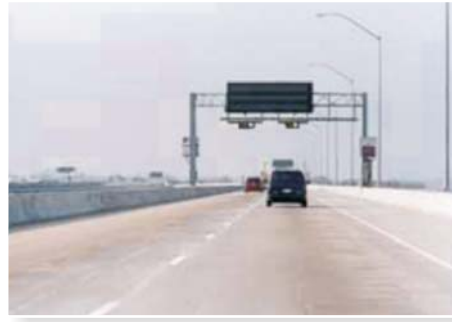
Where infrastructure is in place, regular management can reduce threats to the PTW rider.

The danger from barriers and restraints. When a PTW user has lost control of his vehicle, the consequences can vary widely depending on what type of road restraint system (if any) is installed on that particular road section. As mentioned beforehand, some of the most serious PTW accidents happen when the rider, sliding on the roadbed, passes under the road restraint system and impacts one of its supporting posts e.g. an unprotected wire barriers. Similarly severe crash injuries can also occur when the rider impacts a barrier system running all the way to the roadbed (concrete barriers for instance), being suddenly decelerated by the contact with the hard and unresponsive surface.





Example of a dangerous barrier
(source: <http://www.fema.ridersrights.org>)



Examples of Jersey roadside barrier
(source: ITC, Bulgaria)

Some solutions are known and available. Research is ongoing into the impact behaviour and injury patterns arising from the sliding PTW rider. Already, barrier manufacturers have solutions for both new equipment and existing barriers. These road restraint systems run closer to the ground (often with a double band) preventing sliding under the barrier and impacting its support posts. They are designed and tested to minimise the risk to the sliding PTW rider and can cushion the slide to lessen injury risk.



Example of PTW-friendly safety barrier: riders are protected from the support posts
(Source: <http://www.fema.ridersrights.org> and Internet)

Designers should view the road with the eye of the PTW rider. Road infrastructure can be designed to make use of mitigation practices when accident scenarios are taken into consideration. This will maximise safety for all types of users. For example, providing more distance between the roadside and posts or signs, in order to leave space for users to attempt to regain control of their vehicle or to slow down before impact.

Maintenance

Keeping infrastructure in proper condition can also play an important role in reducing PTW accident numbers.



Potholes and differently coloured
Surface may cause a loss of grip.
(source: Craig Carey-Clinch, MCI, UK)



Dirt on the roadway may cause
riders to lose grip
(source: ITC, Bulgaria)



Patrol for potholes: prevention of potholes through regular maintenance work is also essential for PTW riders. A road surface in excellent condition is more likely to lead to a maximum level of security. Furthermore aggregate and dust debris from pothole creation can make a road surface slippery with disastrous consequences for the PTW rider.

Keep the road clean: use road sweepers to regularly clean the road surface. In general lack of maintenance is an unacceptable threat to all road users, and can turn the infrastructure in a deadly trap.

Road alligators and tar snakes: these are terms for hazards faced especially by PTW riders. The terms come from the PTW culture itself. "Road alligators" are parts of shredded tyres (especially commercial vehicle tyres) that are often seen on the highway. Getting them off the road as soon as possible can remove an accident source. "Tar snakes" form when certain types of crack filler used to seal the road surface, e.g. simple bitumen. Some of these are especially slippery when the outside temperature gets warm or it rains. Crack filler is available that offers a higher level of traction for the PTW and should be chosen for public road use. Manufacturer instructions for crack fillers should always be followed closely, and these materials should never be used as a substitute for repaving of a public road surface.

Good quality road markings are of considerable importance for PTWs: markings which are in pristine condition and which offer a good degree of reflectivity in night conditions help the rider "read" the road and plan his speed and attitude beforehand. At the same time, some marking materials can become very slippery when the temperature is hot or during rain. Use of materials that are appropriate for PTWs and regular audits with on-board apparatus should be done by the infrastructure rider or road administration.

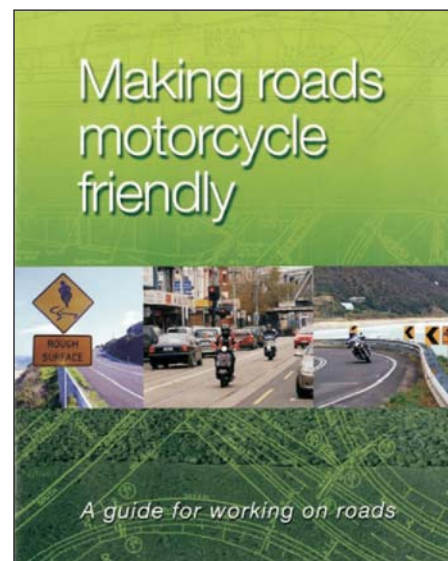


Part of the roadway is raised creating a danger for a PTW (Source: IBZH, NL)

New Norms

The Committee of European Normalization (CEN) has mandated the drafting of a new part to the European Standard for road restraint systems³⁴. In the near future, PTW riders will benefit from roadside barriers studies specifically designed and tested with their safety in mind. This common and harmonised European Norm (hEN) which will have a single set of criteria valid from Lisbon to Bucharest.

Standards are also being developed in other countries, for example in Victoria, Australia.



Source: Roads Cooperation, Victoria, Australia



³⁴ EN 1317-8, Standard under Development, CEN

IMMA position

IMMA calls for:

- appropriate maintenance of road infrastructure;
- consider PTW safety at the road design stage;
- explore new legislation aimed at the protection of vulnerable road users including PTW riders;
- revise and develop standards that encourage PTW-friendly design, construction and maintenance;
- envelop standardized procedures for data collection on accidents involving the infrastructure. Perform PTW oriented road safety audits and inspections;
- national Governments should promote PTW-friendly infrastructure guidelines;
- campaigns at all levels to learn more about and explain the roles and relationships of the infrastructure, rider and the PTW;
- the use of road rating systems to improve the road network e.g. iRAP and the use of experience from other countries for upgrading infrastructure.



Annex 5

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